

We claim,

1. A medical system, comprising:

a) an ambulatory medical device (MD) comprising MD electronic control circuitry that further comprises at least one MD telemetry system and at least one MD processor that controls, at least in part, operation of the MD telemetry system and operation of the medical device, wherein the medical device is configured to provide a treatment to a body of a patient or to monitor a selected state of the body; and

b) a communication device (CD) comprising CD electronic control circuitry that further comprises at least one CD telemetry system and at least one CD processor that controls, at least in part, operation of the CD telemetry system and operation of the communication device, wherein the CD telemetry system sends messages to or receives messages from the MD telemetry system, wherein a message is sent using one of a predefined plurality of preambles.

2. The system of claim 1 wherein a first portion of the MD telemetry system is incorporated into the MD processor and a second portion of the MD telemetry system is external to the MD processor, or wherein a first portion of the CD telemetry system is incorporated into the CD processor and a second portion of the CD telemetry system is external to the CD processor.

3. The system of claim 2 wherein (1) the MD electronic control circuitry comprises at least one external MD functional module, other than the second portion of the MD telemetry system, that is external to the MD processor, (2) the CD electronic control circuitry comprises at least one external CD functional module, other than the second portion of the CD telemetry system, that is external to the CD processor, (3) the MD processor comprises an internal MD CPU and at least one other internal MD functional module, or (4) the CD processor comprises an internal CD CPU and at least one other internal CD functional module.

4. The system of claim 1 wherein the medical device comprises and implantable infusion pump for selectively dispensing a drug.

5. The system of claim 4 wherein the drug comprises insulin.

6. The system of claim 1 wherein the medical device comprises an implantable sensor for sensing a selected state of the body.

7. The system of claim 6 wherein the sensor comprises a glucose sensor.

8. The system of claim 1 wherein the medical device comprises an implantable electrode for selectively stimulating a portion of the body of the patient.

9. The system of claim 1 wherein at least a portion of the plurality of preambles comprise different bit patterns.

10. The system of claim 9 wherein at least one bit pattern comprises a sequence that includes repeated use of a pattern of 10 or 01 and at least one other bit pattern comprises a sequence that includes repeat use of a pattern of 110, 011, 001, or 100.

11. The system of claim 1 wherein at least a portion of the plurality of preambles comprise bit patterns of different lengths.

12. The system of claim 1 wherein a message is sent from the communication device to the medical device using a first preamble and wherein a message is sent from the medical device to the communication device using a second preamble wherein the first and second preambles are different.

13. The system of claim 12 wherein the first preamble comprises a sequence that includes repeated use of a pattern of 110 and wherein the second preamble comprises a sequence that includes repeated use of a pattern of 10.

14. The system of claim 12 wherein at least a portion of the preambles of messages sent to the medical device from the communication device have preambles of varying length.

15. The system of claim 12 wherein the preambles of messages sent to the communication device by the medical device have fixed lengths.

16. The system of claim 15 wherein at least some of the plurality of preambles comprise both different bit patterns and different lengths.

17. The system of claim 1 wherein a first preamble is used to send at least some messages from the communication device to the medical device and a second preamble, which is different from the first preamble, is used to send at least some messages from the medical device to the communication device.

18. The system of claim 1 wherein messages are sent from the communication device to the medical device using at least two different preamble lengths.

19. The system of claim 18 wherein a first preamble captures and holds the attention of the MD telemetry system and as long as it continues to be received.

20. The system of claim 18 wherein a second preamble is of a different pattern than the first preamble and does not hold the attention of the MD telemetry system beyond a prescribed inbound listening period.

21. A medical system, comprising:
a) an ambulatory medical device (MD) comprising MD electronic control circuitry that further comprises at least one MD telemetry system and at least one MD processor that controls, at least in part, operation of the MD telemetry system and operation of the medical device, wherein the medical device is configured to provide a treatment to a body of a patient or to monitor a selected state of the body; and

b) a communication device (CD) comprising CD electronic control circuitry that further comprises at least one CD telemetry system and at least one CD processor that controls, at least in part, operation of the CD telemetry system and operation of the communication device, wherein the CD telemetry system sends messages to or receives messages from the MD telemetry system,

wherein the MD telemetry system is configured to perform a bit pattern recognition that allows a selected level of fault tolerance in concluding that a selected portion of a message matches an expected pattern to be received.

22. The system of claim 21 wherein a first portion of the MD telemetry system is incorporated into the MD processor and a second portion of the MD telemetry system is external to the MD processor, or wherein a first portion of the CD telemetry system is incorporated into the CD processor and a second portion of the CD telemetry system is external to the CD processor.

23. The system of claim 22 wherein (1) the MD electronic control circuitry comprises at least one external MD functional module, other than the second portion of the MD telemetry system, that is external to the MD processor, (2) the CD electronic control circuitry comprises at least one external CD functional module, other than the second portion of the CD telemetry system, that is external to the CD processor, (3) the MD processor comprises an internal MD CPU and at least one other internal MD functional module, or (4) the CD processor comprises an internal CD CPU and at least one other internal CD functional module.

24. The system of claim 21 wherein the bit pattern recognition and the fault tolerance analysis is performed by hardware components.

25. The system of claim 21 wherein at least part of the bit recognition or fault tolerance analysis is performed via software that is being executed by a microprocessor that is operating within the medical device.

26. The system of claim 21 wherein the selected portion of the message is a preamble that is intended to hold the attention of the MD telemetry system for a period of time.

27. The system of claim 26 wherein the period of time is controlled by the length of time that the preamble is being received by the MD telemetry system.

28. The system of claim 26 wherein the period of time is about 24-bit times or more.

29. The system of claim 28 wherein the period of time is about 48-bit times or more.

30. The system of claim 28 wherein the period of time is about 96-bit times or more.

31. The system of claim 21 wherein the fault tolerance is greater than or equal to 1-bit out of 256-bits.

5 32. The system of claim 31 wherein the fault tolerance is greater than or equal to 1-bit out of 128-bits.

33. The system of claim 32 wherein the fault tolerance is greater than or equal to 1-bit out of 64-bits.

10 34. The system of claim 21 wherein the fault tolerance is less than or equal to 32-bits out of 256-bits.

35. The system of claim 21 wherein the fault tolerance is less than or equal to 8-bits out of 128-bits.

36. The system of claim 21 wherein the fault tolerance is less than or equal to 4-bits out of 64-bits.

15 37. The system of claim 21 wherein the fault tolerance is between 1 out of 64-bits and 4 out of 64-bits, inclusive.

38. The system of claim 21 wherein the medical device comprises an implantable infusion pump for selectively dispensing a drug.

39. The system of claim 38 wherein the drug comprises insulin.

20 40. The system of claim 21 wherein the medical device comprises an implantable sensor for sensing a selected state of the body.

41. The system of claim 40 wherein the sensor comprises a glucose sensor.

42. The system of claim 21 wherein the medical device comprises an implantable electrode for selectively stimulating a portion of the body of the patient.